WHAT IS CLAIMED IS:

1. A method of treating a wafer thermally to remove defects contained in single crystalline semiconductor, the method comprising the steps of:

carrying out a first heat treatment on the wafer at a temperature equal to or higher than 1200℃; and

carrying out a second heat treatment on the wafer at a temperature equal to or lower than 800℃.

2. The method of treating a wafer thermally according to claim 1, wherein the first heat treatment is carried out for a time period ranging from 20 minutes to 3 hours.

3. The method of treating a wafer thermally according to claim 1, wherein the first heat treatment is carried out at an ambience of one of hydrogen, inert gas, a first mixed gas of hydrogen and inert gas, and a second mixed gas of oxygen and inert gas.

4. The method of treating a wafer thermally according to claim 3, wherein flow of the inert gas, the first mixed gas, and the second mixed gas ranges from 2 to 50 slm.

5. The method of treating a wafer thermally according to claim 1, wherein a rate of temperature increase in the first heat treatment is from 5 to 100 ℃/min. and a rate of cooling after the first heat treatment is from 5 to 100 ℃/min.

6. The method of treating a wafer thermally according to claim 1, wherein the second heat treatment is carried out for 2 minutes or less.

7. The method of treating a wafer thermally according to one of claim 1, wherein the wafer is made of silicon.

8. A method of producing a semiconductor wafer, comprising the steps of:

producing a single crystalline semiconductor ingot by removing an OiSF ring by means of moving the OiSF ring from a center of a single crystalline semiconductor growth axis to a circumference and by extending a first area and a second area in which delta (Oi) as oxygen concentration difference between initial oxygen concentration and oxygen concentration after heat treatment in $N_2$ ambience at 1000°C for 64 hours, is more greatly increased than other areas;

providing a wafer by slicing the single crystalline semiconductor ingot;

carrying out a first heat treatment on the wafer at a temperature equal to or higher than 1200°C; and

carrying out a second heat treatment on the wafer by rapid thermal annealing at a temperature equal to or lower than 800°C.

9. A semiconductor wafer which is fabricated from a single crystalline semiconductor,

wherein the wafer is produced from a single crystalline semiconductor ingot which is formed by removing an OiSF ring by means of moving the OiSF ring from a center of a single crystalline semiconductor growth axis to a circumference and by extending a first

area and a second area in which delta (Oi), as oxygen concentration difference between initial oxygen concentration and oxygen concentration after heat treatment in $N_2$ ambience at 1000°C for 64 hours, is more greatly increased than other areas, wherein grown-in defects are removed from the wafer by heat treatment, wherein bulk micro-defects are formed in the wafer, and wherein a defect-free layer is formed from a surface of the wafer to a predetermined depth.

10. The semiconductor wafer according to claim 9, wherein the first area and the second area in which delta (Oi) is greatly increased is extended to 20 to 90% of a wafer diameter.

11. The semiconductor wafer according to claim 9, wherein the defect-free layer is formed to a thickness of 10 to 100$\mu m$ from the surface.

12. The semiconductor wafer according to claim 9, wherein a first heat treatment is carried out on the wafer at a temperature equal to or higher than 1200°C and subsequently a second heat treatment is carried out on the wafer by rapid thermal annealing at a temperature equal to or lower than 800°C.

13. The semiconductor wafer according to claim 9, wherein the semiconductor wafer is a silicon wafer.

14. An epitaxial semiconductor wafer,

wherein the wafer is produced from a single crystalline semiconductor ingot which

is formed by removing an OiSF ring by means of moving the OiSF ring from a center of a single crystalline semiconductor growth axis to a circumference and by extending a first area and a second area in which delta (Oi) as oxygen concentration difference between initial oxygen concentration and oxygen concentration after heat treatment in $N_2$ ambience at 1000°C for 64 hours, is more greatly increased than other areas, wherein grown-in defects are removed from the wafer by heat treatment, wherein bulk micro-defects are formed in the wafer, wherein a defect-free layer is formed from a surface of the wafer to a predetermined depth, and wherein an epitaxial layer is formed on an upper surface of the wafer.

15. The epitaxial semiconductor wafer according to claim 14, wherein the epitaxial layer is formed 1 to 20 μm thick.

16. The epitaxial semiconductor wafer according to claim 14, wherein a first heat treatment is carried out on the epitaxial semiconductor wafer for 20 minutes to 3 hours and a second heat treatment is carried out on the wafer by rapid thermal annealing for a time equal to or less than 2 minutes.

17. A method of growing an ingot, comprising the steps of:

accelerating a speed of growing from a melt-down silicon to a single crystalline silicon ingot;

maintaining a temperature gradient distribution from a central part to a circumferential part of the ingot at a growing interface between the melt-down silicon and the ingot grown by crystallization;

forming an OiSF ring at the circumferential part by moving the OiSF ring from a center of a single crystalline semiconductor growth axis to a circumference; and

extending an area in which delta (Oi) is greatly increased as compared to that of other areas, wherein the delta (Oi) is a difference between an initial oxygen concentration and oxygen concentration after heat treatment with a predetermined thermal history.

18. The method of growing an ingot according to claim 17, wherein the heat treatment with the predetermined thermal history is carried out at 1000°C for 64 hours in a $N_2$ ambience.

19. The method of growing an ingot according to claim 17, wherein the area in which delta (Oi) is greatly increased is formed to occupy 20 to 90% of a diameter of the ingot.